

WHAT IS CLAIMED IS:

1. An elongated truss boom adapted to be flattened and coiled to a stowed configuration comprising:
  - a plurality of longerons arranged parallel to and equidistant from a longitudinal axis of the truss boom forming a polygonal cross section normal to the longitudinal axis;
  - a plurality of fixed battens; and
  - a plurality of moveable battens;wherein the fixed battens and the moveable battens are coupled to the longerons to form a plurality of polygonal frame members which are located in a series of planes normal to the longitudinal axis; and
- wherein the fixed battens interconnect the longerons to form two opposing rigid ladder shaped structures which are moveably connected by movable battens.
2. An elongated truss boom as claimed in claim 1, wherein the moveable battens are fully extended and the ladder shaped structures are separated when the truss boom is extended, and the moveable battens are closed and the ladder shaped structures are together such that the longerons are substantially coplanar when the truss boom is stowed.
3. An elongated truss boom as claimed in claim 2, further comprising a plurality of diagonals that interconnect adjacent polygonal frame members.

1           4. An elongated truss boom as claimed in claim 1, wherein the longerons have a  
2 corrugated cross section.

1           5. An elongated truss boom as claimed in claim 4, wherein the corrugated cross  
2 section is "L" shaped.

1           6. An elongated truss boom as claimed in claim 1, wherein four longerons are  
2 arranged in a square polygonal cross section.

1           7. An elongated truss boom as claimed in claim 1, further comprising a self  
2 actuation means which biases the moveably coupled battens and the truss boom in an  
3 expanded position.

1           8. An elongated truss boom as claimed in claim 1, further comprising a  
2 mechanically actuated locking means which releases the truss boom for stowage and locks  
3 the deployed truss boom in an expanded configuration.

1           9. A mechanical assembly machine for deploying a truss boom comprising:

2 a drum;

3 a stowed flattened truss boom rolled into a coil around the drum; and

4 a means for unrolling the coil.

1 10. A mechanical assembly machine as claimed in claim 9, further comprising:

2 an actuating and locking mechanism which holds a leading edge of the truss boom

3 and includes an upper plate, a lower plate, diagonal tensioners, and oscillating longeron  
4 clamps; and

5 a control arm which connects the actuating and locking mechanism to the drum;

6 wherein the actuating and locking mechanism deploys a mechanically actuated truss  
7 boom by feeding out the leading edge and then mechanically expanding and locking the  
8 truss boom while the truss boom is unrolled.

1 11. A mechanical assembly machine as claimed in claim 10, wherein the actuating

2 and locking mechanism includes a heating means, and the heating means restores a truss

3 boom having longerons which have been flattened to a ribbon shape for stowage to their

4 original corrugated cross section during deployment.

1           12. A mechanical assembly machine as claimed in claim 11, wherein the heating  
2 means straightens a truss boom having longerons with folded expansion joints during  
3 deployment.

1           13. A method for stowing an elongated truss boom comprising:  
2 compressing the truss boom laterally into an elongated flat structure;  
3 rolling the flat structure into a coil; and  
4 unrolling and expanding the truss boom into an elongated three dimensional  
5 structure.

1           14. The method for stowing an elongated truss boom as claimed in claim 13,  
2 further comprising:  
3 heating a truss boom having longerons which have been flattened to a ribbon shape  
4 for stowage to restore their original corrugated cross section during deployment.

1           15. The method for stowing an elongated truss boom as claimed in claim 13,  
2 further comprising:  
3 heating a truss boom having longerons with folded expansion joints to straighten  
4 the longerons during deployment.

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PATENT APPLICATION